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Montana Department of Agriculture
Environmental Management Division
Technical Services Bureau
Helena, Montana 59620

OBSERVATIONS OF A GAS EXPLODING DEVICE FOR CONTROLLING BLACK-TAILED PRAIRIE DOGS

By

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ABSTRACT

A field trial was conducted to observe and record the results of a gas exploding device called *Rodent Torch* used to control black-tailed prairie dogs. Ignition of a propane/oxygen mixture injected for 30 seconds into burrows reduced prairie dog numbers 13.0%. Doubling the injection time to 60 seconds resulted in a 63.3% reduction.

Technical Report 90-04
November 1990

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INTRODUCTION

Recent cancellations by the U.S. Environmental Protection Agency of rodenticide registrations, such as Compound 1080 and strychnine, have greatly reduced toxicants available to control damage caused by field rodents. The high cost of research to register new rodenticides or to provide requested data to maintain existing registrations cause doubt that chemical toxicants will remain available. Therefore, means of rodent control other than chemical toxicants also need to be researched.

One method using a concussion device sold under the brand name *Rodent Torch* has been developed for control of burrowing rodents. Initial development occurred in Nevada for use on pocket gophers (*Thomomys spp*). This is a portable system that mixes propane and oxygen gases which are injected into rodent burrow systems and ignited. The concussion caused by the explosion reportedly kills the rodents within the burrow system.

A distributorship for *Rodent Torch* has been established in Montana but field data on its effectiveness is not available. Such data is needed before recommendations on its use can be made to landowners and rodent control personnel.

OBJECTIVE

The objective of this study was to determine the effectiveness of the *Rodent Torch* in reducing black-tailed prairie dog (*Cynomys ludovicianus*) populations and to record the labor required for treatment.

STUDY AREA

A 20 acre prairie dog town, located on a private ranch in eastern Yellowstone County near Billings, Montana, was chosen for treatment in this study. The study site was located on a dryland sagebrush/grass pasture used for summer cattle grazing. Vegetation was sparse to nonexistent within the prairie dog town.

The study was conducted during the first 2 weeks of May, 1990.

METHODS

The prairie dog town was divided into 3 plots. One plot served as a no treatment control. The burrows on the remaining 2 plots received the injected propane/oxygen mixture for 30 and 60 seconds, respectively.

Prior to treatment, all prairie dog burrow openings were covered with dry cow chips. Only those burrows reopened after 3 days were treated.

The gas mixure was applied by a commercially made concussion device called a *Rodent Torch*. This device is composed of a 5 foot wand attached by two gas hoses and an electrical wire to oxygen and propane tanks and an electrical source. At one end of the wand is located a valve that allows the gases to flow through the wand and an electrical switch. At the end of the wand, enclosed in an open metal cylinder, is the outlet for the gases and an automotive spark plug.

Two people were involved in the actual application. One person drove a pickup containing the gas cylinders and the other person operated the wand.

Percent reduction in prairie dog numbers was determined by counting active prairie dogs on each plot before and after treatment. Visual counts using binoculars were obtained on marked counting areas within each treatment and control plot. These counts were made at five minute intervals on each plot for three consecutive days before and after treatment. The nine pretreatment and posttreatment visual counts were averaged to compute activity indices (AI) for each plot. Percent reduction in activity caused by the *Rodent Torch* was computed as follows:

$$\text{Percent Reduction In Activity} = \frac{\text{Pretreatment AI} - \text{Posttreatment AI}}{\text{Pretreatment AI}} \times 100$$

Time and cost of application were also recorded.

RESULTS

Percent reduction in activity on the treated plots was 13.0% for the 30-second injection and 63.3% for the 60-second injection. No significant change occurred in activity on the control plot (Table 1).

Pretreament burrow closures required 2 and 6 manhours for the 30-second and 60-second plots, respectively (Table 1).

The 30-second plot (6.8 acres) required 2.5 manhours to treat 51 burrows. A total of 145 burrows were treated on the 60-second plot (9.3 acres) requiring 9.0 manhours of labor (Table 1). Total cost of the gases used in the complete study was approximately $1.70 for propane and $10.00 for the oxygen.

DISCUSSION

Increasing the gas injection time to 60 seconds increased percent reduction in activity. However, efficacy at -63 percent is not adequate for long term population reduction. Although a further increase in injection time may improve efficacy it may require too much application time to be operationally feasible except on the smallest of prairie dog colonies.

Table 1. Efficacy and application labor of the *Rodent Torch* concussion device on black-tailed prairie dogs.

Plot	No. Burrows Closed	Burrows Reopened No./%	Acres	Pretreatment Manhours	Treatment Manhours	Manhours/ 100 Burrows	Percent Control
30-Second	113	51/45	6.8	2	2.5	3.98	-13.0
60-Second	324	145/45	9.3	6	9.0	4.60	-63.0

Proper safety equipment is essential when using this system. The explosions are very loud and good quality hearing protection is a necessary. Eye, hand, and arm protection is also needed because of debris that is ejected out of the burrows. This device can present a potential fire hazard if use in dry conditions.

Data from this study indicate that the *Rodent Torch* is less effective than previously used methods for controlling black-tailed prairie dogs such as grain baits and fumigants. Also, a significant increase in application labor is required. Although additional replication is necessary, the preliminary data suggest that this technique may not be a practical or economical method for prairie dog control.

RECOMMENDATIONS

To fairly evaluate the *Rodent Torch* as a rodent control tool, further testing on prairie dogs and other burrowing rodent species is needed.

ACKNOWLEDGMENTS

We wish to thank Wayne Hannah, Montana distributor of *Rodent Torch*, for providing and operating the equipment used in this study. Larry Handegard assisted with the application. Dave Able allowed the use of his property for the study.

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